

# Coal-fueled electric cars sully air, too



Road Worrier  
**Bruce Siceloff**

Jan. 4 2015  
News + Observer

A new study finds that plug-in electric cars can be the dirtiest vehicles on the road – when they run on electricity produced from the favorite fuel of America's utilities: coal.

Nissan Leafs, Teslas and other electric cars have no tailpipes and no exhaust. But three University of Minnesota researchers looked at air pollution from the entire life cycles of plug-ins and other alternative cars.

Their calculations included the pollutants produced when corn is grown and fermented for ethanol and when minerals are mined to make the big lithium-ion batteries that power plug-in cars. And for plug-in cars, they did the math on electricity derived from burning coal – and from cleaner sources such as natural gas, wind and solar.

The study, online at [bit.ly/1xLuhDf](http://bit.ly/1xLuhDf), was published in December in the Proceedings of the National Academy of Sciences. It measured each car's production of ground ozone and fine particulate matter – two unhealthy elements of air pollution, which kills more than 100,000 people in the

SEE SICELLOFF, PAGE 8A

## SICELLOFF

CONTINUED FROM PAGE 1A

United States each year.

The conventional gas car ranked in the middle of the pack when it was compared with 10 alternatives. Electric cars were the cleanest if they ran on electricity derived from renewable sources or natural gas. The dirtiest cars relied on coal-fired electricity or on ethanol.

"If we adopt electric vehicles and power them with clean fuel sources, it can cause a large decrease in air pollution," the lead author,

Christopher W. Tessum of the University of Minnesota's Engineering Department, said Monday. "If we power them with a dirty source, coal, it causes an increase in air pollution."

For every 100 air pollution deaths attributable to gasoline cars, Tessum and his colleagues calculate the equivalent of only 26 deaths from plug-in cars, driven the same number of miles, that use electricity created from wind or solar power.

Burning natural gas to make that same electricity is almost as clean (50 deaths) – and, it turns out, much cleaner than burning compressed natural gas in the cars themselves (89 deaths).

### The dirtiest cars

The dirtiest picture was painted for plug-in cars with electricity produced entirely from coal – at 363 deaths on this scale, nearly four times deadlier than the average gasoline car. This exaggerates the true picture, since coal is used to produce less than half the nation's electric power.

Tessum and his colleagues reckon that 45 percent of our electricity will come from coal in the year 2020 – he points out that some projections are lower – and at that share they attribute 186 deaths to these cars.

As old power plants are decommissioned, coal is becoming a smaller part of the electric power supply. Duke Energy says coal is its top fuel source for North and South Carolina customers, currently a 31 percent share. Duke projects that coal will fall by 2029 to third place behind nuclear and natural gas, accounting by then for 21 percent of its electricity.

"If you look at the energy mix in North Carolina, there's also a lot of nuclear, which is carbon-free," said Duke spokesman Randy Wheelless.

Gas-electric hybrid cars

"If we encourage electric vehicles with clean electricity ... the gains are much higher."

**CHRISTOPHER W. TESSUM**

UNIVERSITY OF MINNESOTA

such as the standard Toyota Prius – the kind that don't plug into the electric power grid – show up pretty well in the Minnesota study, with an estimated 71 pollution-related deaths for every 100 deaths from gasoline cars. Since consumers have more direct control over what car they buy than over the fuel source used to produce local electricity, the Minnesota study suggests that buying a thrifty hybrid car might be a good idea.

"Consumers, if they're concerned about the health impacts that come with pollution – things like asthma, heart disease and the increased probability of death – they can buy more efficient gasoline cars like the Prius," Tessum said. "But there's a ceiling for how efficient these cars can be. If we encourage electric vehicles with clean electricity generation, the gains are much higher."

Other studies have faulted electric cars for substantial environmental damage, based on high levels of pollution created in the manufacture of batteries that car owners recharge at their homes at night. Tessum said the Minnesota study calculates much lower pollution levels from battery production.

Siceloff: 919-829-4527

[bruce.siceloff@newsobserver.com](mailto:bruce.siceloff@newsobserver.com)  
or [newsobserver.com/roadworrier](http://newsobserver.com/roadworrier)

Twitter: @Road\_Worrier